

Barcelona's Superblocks as Spaces for Research and Experimentation

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Abstract

Barcelona's superblocks have been recognized as an innovative model for city planning and urban design. This innovation has attracted the attention of researchers, city planners, the media, and students from around the world. Scholars from a variety of disciplines have travelled to Barcelona to learn about these transformations first-hand, asking questions about the transformation process, its impact on the city and its potential to be exported elsewhere. They have used diverse methods including site observations, interviews, discourse analysis, geospatial modelling, and simulation. This article reviews the research undertaken in Barcelona's superblocks and synthesizes what we have learned. This body of work has allowed certain aspects of the superblocks project to be well documented, while many questions remain. A review of the literature on the superblocks project shows that it has created a space for research and experimentation, a place that has served as a vehicle for student learning and exploration, allowing professionals to push the boundaries of what is possible in their respective cities. The Superblocks projects have advanced the agenda for urban experimentation, moving us closer to the flexible and experimental city, that incorporates learning and knowledge creation in daily practice of city planning and design.

Keywords: Barcelona, pedestrianization, superblock, urban experiment

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Introduction

On 9 September 2016, Ariadna Martinez and Philip Mountain arrived at the intersection of Sancho de Avila and Roc Boronat in the Poblenou neighbourhood of Barcelona to participate in an urban experiment. A few days earlier, the city maintenance crew had blocked the intersection from traffic with green plastic bollards and covered the traffic signs with tape and plastic bags. Ariadna and Philip were architecture students at the Universitat Internacional de Catalunya (UIC), and Philip had been hired to work with Salvador Rueda at BCN Ecologia to prepare an architectural workshop led by the *Confederació de Tallers de Projectes d'Arquitectura* (CTPA). Philip and Ariadna were not alone. On that morning, and for the next two weeks, over 200 architecture students from five Catalan universities (IAAC, ETSAB, ETSAV, La Salle and UIC) worked together to transform the road space at the four intersections in the pilot Superilla of Poblenou (Redacció Betevé 2016; Bohigas 2021).

With a meagre budget and limited support from the city, the students had the task of developing temporary structures that would transform the streetscape and “fill the streets with life”. The workshop asked student teams to re-design each intersection based on four themes: a space for culture, a space for commerce, a space for democracy, and a space for leisure and play. Each theme related to fundamental rights in the city, rights that have been given insufficient attention because of our obsessive focus on mobility and traffic flows. In this way, the workshop symbolically and literally recovered space from cars and re-allocated it to other civic uses.

Some teams of students had been involved in a year-long studio project on public space the year before, while others who arrived that morning were just starting the project that same day, at the beginning of the new Fall term. As the students sat there that morning, in an empty street, they had the exceptional opportunity to use their creativity to build something new for this place. What could fill this space with life?

The urban experiment that began that morning in September marked a major turning point for the neighbourhood, the city, and potentially beyond. Philip Mountain recalls recognizing the importance of the moment. “It felt like we were riding the crest of a giant wave. That we had reached a tipping point, where you could feel that something had been set in motion to change the city: that something truly incredible was about to happen.”

Within a few months, Barcelona's Superblocks gained international acclaim, and was propelled into the global conversation on urbanism as a site of radical transformation, experimentation, tactical interventions, and the bold recovery of road space from cars. International headlines heralded “*Barcelona's radical plan to take back streets from cars*”, “*Barcelona Bans Cars and Boosts Tech*” or “*What New York can learn from Barcelona's Superblocks*”. The international enthusiasm proved Phillip correct as the urban experiment caught the attention of observers from around the world (Hu 2016; Roberts 2016, 2019a; Nonko 2017).

This article reflects on Barcelona's Superblocks as a space for urban experimentation and research. I aim to synthesize what has been written about Barcelona's superblocks, particularly in the academic literature. In this article I ask, in which way have the Superblocks been used as a space for experimentation and research? The superblocks emerged in Cerdà's grid as an urban experiment, led by students, with the support from university faculty and research institutions (Rueda 2021). These experimental origins

have left a strong imprint on the project and framed our narrative about superblocks past and future.

The experimental origins of Barcelona's Superblocks have attracted researchers from around the world. Students have come to Barcelona from Colorado, California, Canada, North Carolina, Germany, Belgium, the Netherlands, Italy and the United Kingdom. They have been students and scholars in architecture, landscape architecture, anthropology, geography, engineering, public health and urban planning - asking questions about the process leading to the development of superblocks, the use of public space, health and environmental impacts, improvements in social connections and trust, participation, urban citizenship and community engagement.

This article aims to synthesize what we have learned from the research and experimentation that has transpired in Barcelona's Superblocks. The published work on Barcelona's Superblocks has been organized into three broad themes. The first theme studies the process and politics of creating Barcelona's Superblocks. Research in this theme investigates the political context that allowed the Superilla program to emerge, the political struggles associated with its implementation, and the participatory process involved in the first pilots.

Another body of work has focused on the physical and social transformation produced by superblock projects and how these transformations have improved public space and quality of life. This research has used indicators, observational methods, spatial analysis, modelling and interviews to examine the transformations produced. Research in this theme has focused largely on the monitoring of quantitative indicators, as well as qualitative work through conversations with residents.

Finally, a third group of scholars looks at how the Superblock model might scale-up, expand, or be exported to other locations. What are the public health benefits if the entire city was redesigned using the superblock model? What traffic reductions or air quality improvements might we expect? And is there the potential to implement the Superblock model in other cities? This group of scholars comes from public health, epidemiology, urban design and engineering.

Barcelona's Superblocks have been an enormous source of inspiration for researchers and students, eager to learn if the urban model is improving quality of life and if it can be replicated elsewhere. Most of this work focuses on the original nine-block archetype, with only recent work discussing evolved notions of the Superblock as green corridors (de Boeck 2021). The summary here focuses mostly on academic literature led by scholars and students, but we should remember that neighbourhood groups, associations, and schools have also produced valuable research on local changes they have observed. This work has also contributed to the evolving discourse and learning around the superblock projects. The published work also tends to focus more on the Poblenou pilot, with less attention given to the experiences in Sant Antoni, Les Corts, Horta, Gràcia and el Born.

The remaining three sections review the research on the process and politics of implementation, the transformations observed and the scaling potential of the Superblock model. The article concludes with a discussion of some of the more recent controversies surrounding Barcelona's Superblocks and reflections on how they have advanced the agenda on urban experiments in the field of city planning and design.

Research on Process, Participation and Politics

Extensive work has aimed to understand the political context that allowed the superblock project to emerge (Pérez Fernández 2017; Blanco *et al.* 2020; Herrnstadt 2022) as well as the political pitfalls in its implementation (Frago and Graziano 2020; Guijarro Turégano 2021), especially in the pilot project in Poblenou, and the subsequent improvement in public engagement in the Sant Antoni site and Consell de Cent project (de Boeck 2021). Research in this area has examined questions around the implementation process, the extent to which neighbors were consulted and informed about the pilots, and the lessons drawn from rapidly implementing a pilot project. The controversy over the implementation of the Poblenou pilot has been well documented by multiple authors who conducted extensive interviews with stakeholders and policy makers in favor and against the initial proposal (Oliver and Pearl 2018; Sansão-Fontes *et al.* 2019; Frago and Graziano 2020; López *et al.* 2020; Zografos *et al.* 2020; Vollmann 2021; Staricco and Vitale Brovarone 2022). The debate about early success or failure are intimately tied to local politics which largely framed arguments in favor and against the transformation (O'Sullivan 2017). Interviews by researchers with key policy makers have captured sincere reflections about mistakes and regrets made during the pilot phase (Oliver and Pearl 2018; Roberts 2019b; Guijarro Turégano 2021). These interviews identify oversights in the implementation process as well as how they would do things differently if given another chance.

Zografos and colleagues provide an overview of the political context in which the city rolled out the Poblenou pilot. They contextualize their study in the academic literature on transformational adaptation for climate change and use Barcelona's superblock as an example of an ambitious and transformational urban change needed for climate adaptation. They show that the opposition to the project consisted of inadequately informed neighbours on the one hand, and political adversaries fighting for short term political gains. This politicized context made it difficult to have an engaged discussion about the environmental and urban benefits associated with the pilot intervention, which took a secondary role to the political infighting against the governing city administration (Zografos *et al.* 2020).

Perhaps the most comprehensive analysis of the Poblenou pilot can be found in doctoral dissertation written by Beatriz Guijarro Turégano, *Repensear los Cruces: La Implementación del modelo Superilles: el caso de la Superilla del Poblenou de Barcelona (2016-2021)*. As an urban anthropologist, she walks the reader through the origins and implementation of the superblock from a critical and feminist perspective. Her extensive interviews with key figures are contrasted with an exhaustive review of the official documentation and maps, allowing her to construct a compelling and convincing story about the superilla project. Her familiarity with the details allows her to describe the precise sequence of events, combined with critical interpretation of events, making it essential reading for any student of the superilla project from 2016-2021.

Research on Transformation

A fundamental question concerns how Superblocks are transforming the city. To what extent are they improving quality of life, public space, and environmental quality? To answer these questions, the city has developed a set of indicators that are being monitored by city staff, formerly at BCN Ecologia and now at Barcelona Regional. In an

initial pilot phase, the indicators focused on five topic areas: livability (*habitabilitat*), mobility, biodiversity and green spaces, economic activity, and demographics (BCN Ecologia 2020). This work builds on the extensive experience at BCN Ecologia whose staff team have spent over a decade defining and refining a comprehensive set of urban indicators to assess urban form and quality of life (Rueda *et al.* 2012).

For instance, at the Poblenou site, the city reduced the space dedicated exclusively to vehicles by 16,799 m², created 22,700 m² of new public space for pedestrians, 7,608 m² new pervious surfaces for vegetation, and added 588 spots for public seating and planted 193 new trees (BCN Ecologia 2020).

A new and more extensive system of indicators has been developed to monitor the Superilla Barcelona intervention along Consell de Cent (Barcelona Regional 2021, 2022). The planned green corridor on Consell de Cent will have modern monitoring infrastructure that will position the project to be assessed at a level of detail and rigor that surpasses what the city has done elsewhere. The city is using computer vision technology to monitor the flow of pedestrians, bicycles and vehicles. Data began to be collected in June 2022, months in advance of the intervention, allowing the city to characterize uses and movements in public space along the Consell de Cent corridor at a substantial level of detail.

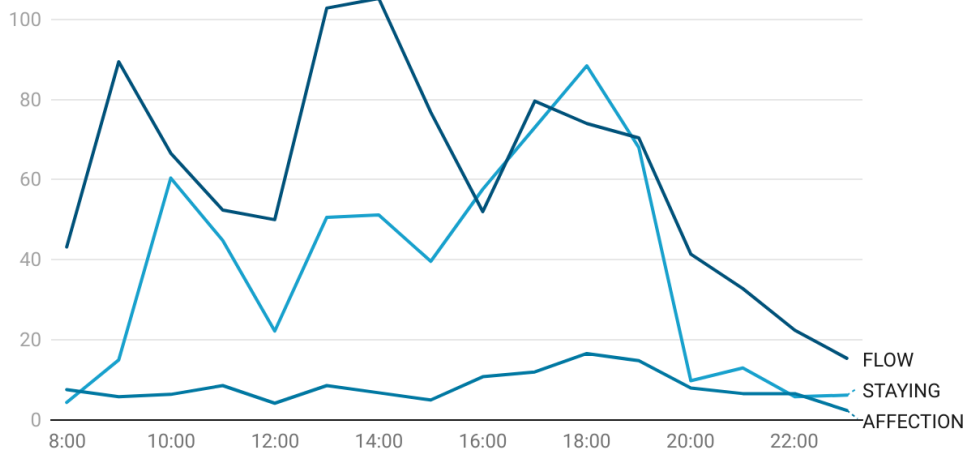
While the city has been able to collect many types of data, there are still critical aspects of urban life that are not captured by the indicators used by the city team, and we have relied on students and universities to fill the gap. One area where students have been able to make a particularly valuable contribution is in counting the number of people using in public spaces. This type of data is difficult for cities to collect because it requires a high number of person hours to manually observe people in public. While city managers may rely on counting technologies to measure the number of people moving through a site (Ryus *et al.* 2016), we still need manual observations to note the age, gender and activities of users in public space, especially if we are interested in noting how they use public facilities, their posture (standing, public seating, informal siting) or their social relations with others. Students from the University of British Columbia, the University of North Carolina (UNC), and the KTH University of Technology have used observational methods to study patterns in the use of public space in the superblocks (Anderson *et al.* 2018; Akaltin *et al.* 2019; Duchêne 2019; Bonomo *et al.* 2020). This work adopts and refines well-established research methods on public life developed by Jan Gehl (Gehl and Svarre 2013).

Planning students from the University of British Columbia began observing public life at the Superilla Poblenou site in June 2018 (Honey-Rosés 2019a) and measurements have been taken during the same week in June for five consecutive years (2018-2022). The consistent observation over time allows for a characterisation of confidence the staying behaviour and pedestrian flows at the Poblenou site (Figure 1).

We observe high use in the early morning and afternoon coinciding with the entry and exit of the nearby school. In a typical afternoon in June, between 60 and 90 people will stay in the pedestrianized street at Sancho de Avila during the afternoon between 17:00 and 19:00 hrs. This only counts people staying in the area, and not people moving through the site. We see that measures of pedestrian flow have a different dynamic in which movement of people through the site peaks during the lunch hour.

Dynamics of Public Life in Superilla Poblenou

People Staying, People Moving & Signs of Affection



Methods for observing public life described in (Honey-Rosés 2019)
Created with Datawrapper

Figure 1. People staying, people moving and signs of affection at the Superilla Poblenou site based on observational data collected over five years from 2018-2022 in June each year. Data may be downloaded at a link in the online version of the figure: https://www.datawrapper.de/_/4OZTi/

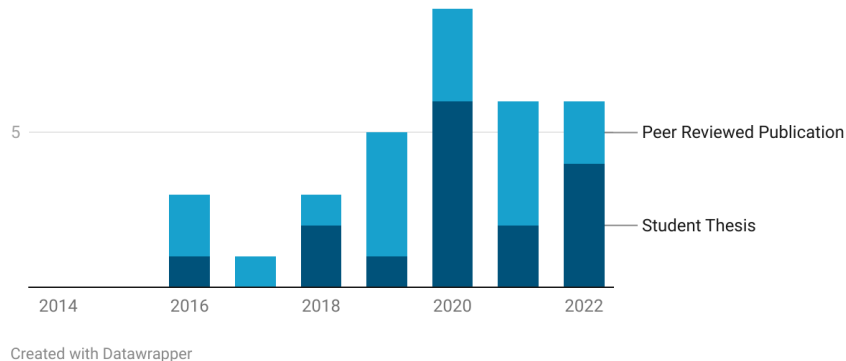


Figure 2. Research on Barcelona's Superblocks.

The observational work by students at the University of British Columbia also counted signs that people knew each other. Every hour, the team counting salutations (kisses, waves, fist-bumps), as well as signs of affection (hugs, kisses). Being in a place where there are signs of affection creates a welcoming environment, with strong social bonds, and reinforces the idea that it this is a place of care (Col.lectiu Punt 6 2019).

Researchers have also aimed to measure social interaction in the Superblocks by combining mobile technology and parametric software (Speranza 2018).

A student team from the University of North Carolina also focused on the quality of the social interactions at the superblock sites (Bonomo *et al.* 2020). Their work is

unique in that it observed and categorized social interactions as positive (greeting, talking, children playing) and negative (using phone and smoking) at the Sant Antoni site and on c/Girona in March 2020, just prior to the pandemic. They find that 75% of the interactions in the Sant Antoni site are positive, while only 62% are positive at the Girona site.

The observational work by Duchêne (2019) from the KTH Royal Institute of Technology is notable because it compares public life within Barcelona's superblocks with non-Superblock areas. Few other studies were as careful to select comparable control sites as this one. Furthermore, the observational methods are similarly inspired by Gehl's methods (Gehl and Svarre 2013) allowing for easy comparison with other studies. Duchêne finds that more people stayed at the superblock sites in comparison to the control sites and that staying behaviour peaked at 17:00 hrs in Poblenou and at 11:00 hrs in Sant Antoni (Duchêne 2019). The number of individuals counted are similar to the values reported by the team at the University of British Columbia, showing that public life is not entirely random, but has stable patterns and rhythms.

Researchers have also asked if there might be unintended negative impacts of the superblock projects, especially gentrification (Anguelovski *et al.* 2018). Interviews with parents at playgrounds in Poblenou site found that parents are certainly concerned about the risk of gentrification (Oscilowicz *et al.* 2020). On the other hand, analysis by the city shows that rents and sale prices of homes in the Superilla Poblenou do not diverge from city wide trends (BCN Ecologia 2020).

Research at the playgrounds located in the Superilla Poblenou were found to be places with an extraordinarily high level of social trust. Researchers used the "lost wallet" question to measure the sense of social connection and trust among parents using these playgrounds. The "lost wallet" question is unique in that it measures trust in a particular public space. When parents were asked if a lost wallet at the playground would be returned to them, two thirds of the parents at the Superilla Poblenou believed it would be returned, while only 4% felt the same way at the Pou de la Figuera playground in the Old City (Oscilowicz *et al.* 2020). This showed that the level of social trust among strangers to be much higher at Superilla Poblenou than in similar places located elsewhere in the city.

A prizewinning undergraduate thesis from Oxford University investigated the extent to which the superblock is conducive to urban citizenship (Pendle 2020). Relying on interviews and participant observations, she concludes that the superblock reinvigorates the city with more livable spaces, but also points out that "the ability of residents to access and exercise these rights and responsibilities is highly differentiated, mediated by gentrification, homelessness and insecure legal citizenship status."

Researchers have also aimed to capture how the Superblocks are changing the sensory experience of the city (Speranza 2016). An acoustic analysis compared the soundscape inside the superilla with exterior streets. Using the HushCity Mobile app, researchers identified that Superilla Poblenou had abundant natural sounds such as birds and wind, thereby creating a more pleasant sensory experience sound (Alsina-Pagès *et al.* 2021). A landscape architect from Wageningen University explored similar questions, examining the intersections of Barcelona's Superblock in Poblenou to produce design guidelines with the aim of improving environmental comfort, acoustic comfort, olfactory comfort, thermal comfort and microclimate (Acuña Kuchenbecker 2019).

Research on Scaling, Expanding and Exporting Barcelona's Superblock Model

Another group of scholars examine the impact of scaling superblock model beyond its pilot locations. These researchers ask: what are the implications of scaling the superblocks throughout the city? What are the health benefits of expanding superblocks throughout Barcelona? To what extent can we expect reductions in air pollution, noise, heat? And looking outside of Barcelona, what is the potential for other cities to implement the Superblock model based on their own street network and urban morphology?

Mueller and colleagues estimate the public health benefits of extending the superblock model across the entire city, with the implementation of 503 superblocks throughout Barcelona (Mueller *et al.* 2020). This work made a significant contribution to the public conversation about the adoption of Superblocks because it provided evidence that the widespread adoption of the model could save lives (Mueller *et al.* 2020). These health arguments quickly entered the public debate, helping to advance the superblock agenda and fending off critique of the model.

The team examined two public health benefits: preventable premature mortality and changes in life expectancy. These health improvements are based on expected increases in active mobility, improved air quality, reduced traffic noise, improved access to green space, and a reduced heat island effect. The research team uses well-established dose-response relationships in the public health literature to establish the health benefits for each environmental improvement. Critically, they rely on city estimates for the associated traffic and emission reductions that would be produced by upscaling the Superblock project. The city estimates that extending the superblock model to the entire city would reduce car/motorcycle modal share from 26.1% to 21.1% (19% reduction), and slightly increase walking and cycling.

Based on these assumptions, the research team finds that rolling out 503 Superblocks would prevent 667 premature deaths annually in Barcelona and the average life expectancy would increase almost 200 days due to reductions in harmful environmental exposures. Most of the gains in life expectancy and prevented premature mortality come from improvements in air quality, although the 95% confidence interval overlaps with 0. The study uses 2012 baseline NO₂ values of 47.18 ug/m³ and assume that they can bring it down to 35.72 ug/m³, leading to 291 preventable deaths. The study only accounts for NO₂ and no other traffic-related air pollutants, which would only increase the expected health benefits of the measure. Mueller and colleagues, point out that there are many other health benefits of street calming and green spaces that are not accounted for in this work. The creation of health school street environments and play streets provide children with the opportunity to engage in more physical activity. Green spaces and quality public spaces also improve social cohesion, sense of place and community which are another pathway to improved health and wellbeing.

A team from the Barcelona Supercomputing Center estimate the improvements in air quality associated with scaling the Superblock model to the entire city (Rodriguez-Rey *et al.* 2022). They also studied the expected air quality improvements associated with traffic lane reductions through tactical interventions and a Low Emission Zone. The authors combined a traffic and pollutant emissions model with a multiscale air quality model to estimate improved air quality as a result of these three measures (Superblocks, lane removal, low emission zone). They find that when implemented in

isolation, scaling the superblocks would be insufficient to meet European air quality standards (Rodríguez-Rey *et al.* 2022), especially the newer standards for NO₂ of 10 µg/m³. Only a suite of policy measures that can drastically reduce the use of private vehicle use are sufficient for the city to meet EU air quality standards.

Another group of scholars have studied the scalar tensions generated by inserting neighbourhoods' cells inside a grid network. A team of urban designers from Torino, Italy examined the challenges associated with upscaling the 9-unit superblock-archetype to the entire city, with particular attention to the tensions and conflicts that might be created between the neighbourhood scale and the functional needs of the city (Scudellari *et al.* 2020). They argue that the current city plan would need a revision before being prepared for such a drastic re-organization of the city. They point to the tensions that emerged in the Poblenou pilot, especially between residents and non-residents. The authors also questioned feasibility of creating cellular neighbourhoods in a homogeneous street network such as the Cerdà grid, arguing that developing traffic-calmed neighbourhoods is easier in urban morphologies with a clear street hierarchy such as Born or Gràcia (Scudellari *et al.* 2020).

A thesis project from the UPC School of Industrial Engineering also interrogates city plans to upscale Superblocks. This work examined the priority streets listed for street calming measures as part of the city plan to extend Superblocks. The thesis maps the location of public services, schools and green spaces to identify if the demand for calm streets matches the city's proposed location for these calmed streets. The thesis concludes that revisions to the existing prioritization plan could yield improvements. In particular, the street calming in Consell de Cent, Londres, Cartegená and Sicilia should be extended, while the prioritization of Rocafort might need reconsideration (Nadal Agustí 2016).

Scholars have also analysed the potential of the implementing superblocks in other cities based on various street network designs. In a study published in *Nature Sustainability*, Eggimann reports that cities like Paris and Mexico City have high potential for implementing superblock schemes, while Atlanta or London are much less conducive to this approach (Eggimann 2022a). The same author examines the potential of developing Superblocks in the nine major cities of Switzerland. He finds the current street network of Swiss cities is amenable to adoption of the superblock, and in the case of Basel up to 18% of the street network could be re-designed to create new urban green spaces (Eggimann 2022b).

Barcelona's Superblocks has also inspired other cities to design programs of their own that similarly rely on experimentation, traffic removal, pedestrianization, and reclaiming public space from cars. The city of Vitoria-Gasteiz has most explicitly replicated Barcelona's approach, where research has shown that the implementation of the superblock model has reduced pedestrian travel times by 4-5% (Delso *et al.* 2018). Superblocks have also been a source of inspiration for similar projects in Bogotá, Colombia and Washington DC (Navarro-Serer 2021). In the United Kingdom, city planners are using similar principles but calling them Low-Traffic Neighbourhoods or LTNs (Aldred and Verlinghieri 2020).

While many may view the replication of the model as a success, some scholars are critical of the city strategy to sell the model to other cities, particularly in Latin America (Frago and Graziano 2020). Still, it is hard not to be inspired by those who visit Barcelona and return home with lessons for their own city. A particularly fascinating

example of this is a Master's thesis on Barcelona's Superblocks written by the mayor of a town in Belgium, Gooik (population 9,236). The author's experience as a city professional is evident in his thesis, as he demonstrates an intimate understanding of the evolution of the superblock from the traditional 9 block archetype, to the green axis model. The thesis outlines potential paths forward for the city, in which planners will need to balance a trade-off between the speed of implementation, the quality of the street re-designs and the level of ambition that is sought, ranging from low-cost tactical interventions to high quality walkable streets. In this balancing act between speed and quality, the city has shifted. Early in the conversation it was suggested that all of Barcelona's Superblocks could be rolled out with a single tactical intervention across the entire city. Since then, this has been deemed unfeasible for logistical, aesthetic and practical reasons. De Boeck also suggests that a rapid implementation of street calming measures with permanent (not tactical) measures is not financially feasible (de Boeck 2021). Therefore, the green-axes approach appears to prioritize the rapid reclaiming of more pedestrianized space with higher quality interventions.



Figure 3. Students from the University of British Columbia (Vancouver, Canada) learning about the Superilla pilot in Poblenou in June 2018. Photo credit: Jordi Honey-Rosés

Superblock Barcelona

Most of what has been written about Barcelona's Superblocks until now has focused on the nine-block archetype. However, the notion of the Superblock in Barcelona has evolved. The beta version of Barcelona's Superblock was developed by architecture students at the Poblenou site in September 2016, and this urban experiment most closely resembles the classic superblock archetype. Since then, the idea has undergone modifications. This city improved on the student proposal and version 2.0 is what we see in Poblenou today (Figure 4).



Figure 4. Superblock playground at the intersection of Roc Boronat and Sáncho de Avila in Poblenou.
Photo Credit: Òscar Giralt.

In Sant Antoni we are able to see version 3.0 and 4.0 just a few blocks from each other. Version 3.0 is at the intersection of Comte Borrell and Parlament, and it is colourful and tactical design pulls you in and invites you to stay. It is a joyful and vibrant place that feels a bit like a playground for adults (Figure 5).



Figure 5. Superblock Sant Antoni at the intersection of Comte Borrell and Parliament.
Photo Credit: Óscar Giralt.

However, this model is difficult to scale for the entire city. Superblock version 4.0 is nearby, in front of the Sant Antoni Market at Comte Borrell and Tamarit. Here we see a permanent version of a Superblock intersection, with a full street re-design and formal pedestrianization. The intersection has four large trees, including a jacaranda and oak, planted in a new public space previously devoted to vehicle traffic. From an urban design perspective, version 4.0 is scalable for the entire city.

In March 2021, the city announced a shift in its strategy, choosing to rescale and refocus the Superblock program on green axis and green corridors. This shift has generated some confusion, and understandably so. The urban planning team, under the leadership of Xavier Matilla, interpreted Barcelona's superblocks as essentially a strategy to reclaim Barcelona's streets for green space and pedestrians. Instead of scaling the nine-block archetype to the entire city, city planners outlined a plan for green corridors with a new street design, green infrastructure, fewer cars, and prioritizing people, that could eventually be scaled to every street in the Eixample. As illustrated by the project

name, Superilla Barcelona, planners were not proposing a one-off city greening project. Rather the revised aspiration for Superblock Barcelona is to develop a new urban model for Barcelona's Eixample district, and a full overhaul of what it feels like to be in the city district designed by Idelfons Cerdà, the city planner who coined the term 'urbanism'. In other words, by transforming an entire corridor from one side of the city to another, planners would be showing residents what their city could look like in the future. In this way, Superblock Barcelona began a new conversation about what the future streetscape of the Eixample might look like (Honey-Rosés 2021).

Superblock version 5.0 is what you see on Consell de Cent today, and this corridor must be interpreted as a proposal for what the Eixample district might look like in the future. The ambitious street transformation along the 2.8 km of Consell de Cent has increased the pedestrian space by 13,008 m² and created 5,299 m² in new green space (Ajuntament de Barcelona 2023), thereby providing the backbone for a new green axis plan. This corridor also includes the transformation of four traffic intersections into green spaces, specifically where Consell de Cent intersects with Rocafort, Compte Borrell, Enric Granados and Girona.

The first segment of the Consell de Cent project was inaugurated in April 2023, just in time for the Sant Jordi celebrations. While the project has been welcomed by much of the city, the detractors and nay-sayers remain (Cols 2022). In September 2023 a judge ruled that technical and procedural requirements were not met during the transformation process (Honey-Rosés 2023), threatening to force the city to undo the project. However any reversion is highly unlikely, and the legal attacks as against Superblock Barcelona might be seen as part of a wider legal strategy against the former Mayor (Montaner 2023), as the legal, technical foundations of the project are sound (Matilla 2023).

Criticism over the equity impacts of Superblocks also remain unresolved. On the one hand, there are concerns about 'green gentrification' and the increases in rents that are likely to be seen on streets that have been traffic calmed or at intersections that have been converted into parks and green areas. It is difficult to ensure that the benefits of urban greening will be fairly shared by residents and not contribute to the expulsion of renters, students or low-income households (Anguelovski *et al.* 2023). Another weakness relates to how traffic is distributed on surrounding streets. Early research in the Eixample shows that there is some degree of 'traffic evaporation' (Nello-Deakin 2022) however even if the volume of traffic on alternative streets does not increase, residents who live on streets outside of the Superblocks might still feel unfairly treated. These equity questions are a major challenge for advancing an agenda with the ambitious urban greening and street calming.

Superblocks advancing the agenda for urban experimentation

“As events unfolded, we began to appreciate the significance of what we were doing. And we began to realize that our experiment was not innocuous rather it was more important than we could imagine, and so thus its consolidation earned renewed significance.”

Ton Salvadó, Barcelona City Architect (2015-2019) as quoted in Guijarro Turégano (2021)

The Superblocks projects have advanced the agenda for urban experimentation, moving us closer to the flexible and experimental city, and helped us incorporate learning and knowledge creation in daily practice of city planning and design. Superilla projects have shown us the value of experimentation and increased our tolerance for urban experiments. It has set an important precedent regarding the scope, size and speed of which transformational change is possible. While Barcelona is not alone in execution of tactical projects aimed at transformational change (Lydon and Garcia 2015; Silva 2016), the international attention and excitement generated by the superilla project has been special. It has attracted an ecosystem of students, scholars and professionals, interested in studying this transformation as a vehicle for student learning and exploration, and simultaneously allowing urban professionals from other cities to re-think what is possible in their respective city.

Our climate emergency demands more ambitious and radical urban experiments that are embedded within a framework for learning. The superblock began an informal experiment in the sense that it did something new or novel. This novel experiment was not ad-hoc. To the contrary, it was hyper-planned, and its transportation system was re-organized and rationalized with the Superblock model in mind. Salvador Rueda and his team at BCN Ecologia had been incubating the idea for decades. And yet this hyper planning did not involve a formal experiment. For systematic learning, urban experiments must move beyond informal experiments and evolve toward formal experiments (Honey-Rosés and Stevens 2019). It was novel and helped us learn, but it was not a systematic intervention designed for creating new knowledge. Formal experiments need comparison groups to compare outcomes between intervention and non-intervention sites. The ideal urban experiments would also randomize who benefits or where the experiment is implemented. Well-designed urban experiments with comparison groups and randomization allow us to generate causal evidence that a specific intervention produces specific outcomes related to public health or public life. Formal urban experimentation in urban planning is rare, and yet there is a small group of researchers who have been using experiment methods to learn about cities (Honey-Rosés 2019b). Formal urban experiments have been used to study the impact of adding more people in public space (Zapata and Honey-Rosés 2020), examine the effectiveness of safety measures in public transportation (Habyarimana and Jack 2011), changes in transportation behavior (Ralph and Brown 2017), the impact of infrastructure investments on land values (Gonzalez-Navarro and Quintana-Domeque 2016), to measure the extent of housing discrimination (Bosch et al. 2010) and to study methods in public engagement (Honey-Rosés et al. 2020).

The difficulty with experimentation, especially formal experimentation, is that experiments sound intimidating and are not always welcome. The word 'experiment' can conjure images of laboratory scientists with lab coats and protective gear. This makes experiments difficult to communicate to the public. The public may express discomfort around the idea of 'being experimented on' or reject the idea entirely. Barcelona city planner, Aridana Miquel notes that the pilot superilla in Poblenou "was communicated as an experiment and that was not well received by the public. Neighbors told us to go experiment somewhere else, not with their lives, 'I am not a laboratory rat'.. (Guijarro Turégano 2021).

Embracing experiments helps us come to terms with our own ignorance as urbanists. Most urban interventions have highly uncertain outcomes in which we do not really

know how neighbors and residents will respond. While few will admit it, architects and urban planners really do not know how the changes they propose will alter human behavior or change city dynamics. As a result, city planners already engage in countless uncontrolled experiments on neighborhoods and cities every day. Experimental urbanism forces city planners to be more honest about the limits of our knowledge and understanding, making it more difficult to hide behind a false certainty that is often communicated to the public about the impacts of urban change. And when we formalize our urban experimentation, we ensure that we can also learn.

Therefore experiments, like much of city planning, is highly uncertain. The premise of any experiment is that we do not know the answers in advance. This requires urban experimenters to have a certain level of maturity and humility. At the same time, the uncertainty associated with experiments makes them difficult to implement, and at times politically unpalatable. Accepting uncertainty is a difficult position for city leaders to take, because residents look to public leaders and technical experts for precise answers and solutions to their problems. Political opponents can easily latch onto the uncertainty associated with experiments to accuse them that they “do not know what they are doing”.

And yet we should not be afraid to recognize that we do not have all the answers and seek to learn from the changes we implement in our cities. Experiments teach us.

Experiments are designed for us to learn and understand. There are countless questions that need answering and could be addressed with well-designed experiments, especially on the topics of urban mobility, public life, public engagement, and the democratization of city building. With this new knowledge, we refine our theories about how cities work. An experimental approach is an evolutionary approach. As a project deeply rooted in experimental principles, evolution is a sign of health and survival, allowing the core principles to adapt to the new and future needs of the city. The superblock model is evolving, and this evolution honours its origins as an experimental project. Experiments teach us to change, adapt, and adjust. The evolution of the superblock project demonstrates that there has been learning, flexibility, and re-conceptualization. And this learning and evolution is strongest evidence of a successful experimental project.

Conclusion

This article reviews the scientific literature and research that has emerged from Barcelona’s Superblocks. The new urban spaces created have served as a vehicle for learning and exploration for students, researchers, and practitioners alike. Most of the literature focuses on the 9-block archetype and on the Poblenou experience specifically, however much more work has taken place that has not been studied in detail. City planners in Barcelona have evolved the idea of the Superblock, using the concept as a tool to advance urban greening pedestrianization and traffic calming. The most recent physical expression of Superblock Barcelona can be seen in Consell de Cent, a green corridor that aims to be the starting point for a wider transformation of the entire Eixample district, thereby creating a true Superblock Barcelona. The evolving and iterative transformations of the Superblock program shows there is learning and adaptation. In this way, the Superblock program has advanced the agenda for urban experimentation, moving us closer to the flexible and experimental city, that incorporates learning and knowledge creation in daily practices of city planning and design.



Figure 6. The pedestrianization of Consell de Cent as part of Superblock Barcelona aims to reconceptualize the typical street in Barcelona's urban grid. Photo credit: Jordi Honey-Rosés.

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